

## REMARKS

Claims 47-59 and 61-65 are pending in the present application and at issue.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

### **I. The Rejection of Claims 47-56 and 60 under 35 U.S.C. 103**

Claims 47-56 and 60 are rejected under 35 U.S.C. 103 as being unpatentable over Shi et al. (U.S. Patent No. 6,054,302) in view of Walon (U.S. Patent No. 4,235,965), as evidenced by the attached sequence alignment (Alignment 1). This rejection is respectfully traversed for the reasons of record.

According to the Office, Shi et al. disclose a method of producing a soluble starch hydrolysate, comprising subjecting an aqueous granular starch slurry at a temperature below the initial gelatinization temperature to the action of two or more enzymes such as an alpha-amylase, beta-amylase or glucoamylase and Walon teaches a method for producing a soluble starch hydrolysate by subjecting a granular starch slurry at a temperature below its initial gelatinization temperature to a bacterial alpha amylase.

However, as the Office concedes, neither Shi et al. nor Walon teach or suggest the use of an enzyme which (i) is a member of the Glycoside Hydrolase Family 13; (ii) has alpha-1,4-glucosidic hydrolysis activity; and (iii) comprises a functional carbohydrate-binding module belonging to CBM Family 20, wherein the carbohydrate-binding module comprises an amino acid sequence having at least 90% homology to the amino acid sequence of SEQ ID NO: 2, as claimed herein.

Nevertheless, the Office states that "One of ordinary skill in the art would have been motivated to use an enzyme comprising the CBM recited in the claims because an enzyme comprising the CBM recited in the claims is an alpha amylase from a *Bacillus* spp. (see attached Alignment 1)." This is respectfully traversed.

As explained in the prior response, Alignment 1 provides the results of a search in the GenCore database for references disclosing a carbohydrate binding domain having the amino acid sequence of SEQ ID NO: 2. The search identified the following eight references disclosing a carbohydrate binding domain with 100% sequence identity to SEQ ID NO: 2:

1. WO 2004/113551 (result 1)
2. WO 2005/003311 (result 2)
3. WO 2005/045018 (result 3)

4. WO 2005/069840 (result 4)
5. WO 2006/065579 (result 5)
6. WO 2007/149699 (result 6)
7. WO 2004/113551 (result 7) and
8. WO 2005/001064 (result 8).

However, all of these references published after Applicants' priority date. Therefore, these references are not prior art. Moreover, the amino acid sequence of SEQ ID NO: 2 is a carbohydrate binding domain, not an alpha-amylase.

In response to Applicants' arguments, the Office stated that "the alignment is cited only to provide evidence of inherent characteristics of prior art *Bacillus* enzymes, and need not itself be a prior art reference." This is respectfully traversed.

The Office has the burden to establish a *prima facie* case of obviousness. In the present case, the burden includes the identification of a prior art reference which discloses an enzyme which comprises a carbohydrate-binding module with at least 90% homology to the amino acid sequence of SEQ ID NO: 2. The Office has not met its burden because it has not identified a single prior art reference disclosing the claimed methods using such enzymes.

Applicants respectfully request the Office to disclose a prior art reference describing an enzyme comprising a carbohydrate-binding module with at least 90% homology to the amino acid sequence of SEQ ID NO: 2.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

## **II. The Rejection of Claims 47-60 under 35 U.S.C. 103**

Claims 47-60 are rejected under 35 U.S.C. 103 as being unpatentable over Shi et al. (U.S. Patent No. 6,054,302) in view of Walon (U.S. Patent No. 4,235,965), as evidenced by the attached sequence alignment (Alignment 1), and further in view of Leach (U.S. Patent No. 3,922,196). This rejection is respectfully traversed for the reasons of record.

As discussed above, Shi et al. and Walon do not teach or suggest an enzyme comprising the CBM recited in the claims.

According to the Office, Leach teaches a method for the enzymatic hydrolysis of granular starch wherein the process may occur in the presence of a membrane, such as an ultrafiltration membrane, wherein the retentate is held in the presence of membranes and the permeate is the soluble starch hydrolysate.

However, like Shi et al. and Walon, Leach also does not teach or suggest an enzyme comprising the CBM recited in the claims.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

### **III. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

All required fees were charged to Novozymes North America, Inc.'s Deposit Account No. 50-1701 at the time of electronic filing. The USPTO is authorized to charge this Deposit Account should any additional fees be due.

Respectfully submitted,

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